In later years another controversy arose as to the part taken by carbohydrates in the formation of animal fat. Lawes and Gilbert had satisfied themselves by their experiments on pigs that fat was undoubtedly produced from carbohydrates. The German physiologists doubted this, and at one time Rothamsted and its followers stood almost alone in their opinion. Now the tide has turned; the experimental evidence for the formation of fat from carbohydrates has become overwhelming, and it is even believed by some that no fat is formed from the albuminoids of the food, but that all the fat stored up by the animal is derived either from carbohydrates or from the fat originally present in the food. The question is one of very great practical importance, the German school formerly insisting that nitrogenous foods must be selected for economic fattening, while the English teaching gave the farmer a much wider choice.

The scope, development and results of the Rothamsted experiments, and the numerous honours jointly conferred on Lawes and Gilbert, have been so recently noticed when speaking of the work accomplished by Sir John Lawes that a repetition of them here seems hardly necessary. Sir J. H. Gilbert was at his death the oldest surviving Fellow of the Chemical Society, having been elected in 1841. He became president of the Society in 1882–3. He was elected a Fellow of the Royal Society in 1860, he served on the Council, and was a regular attendant at the meetings of the Society. With Sir John Lawes he received a Royal medal in 1867. He became a Fellow of the Linnean Society in 1875. He was president of the Chemical Section of the British Association in 1880. He was elected professor of rural economy at Oxford in 1884 and held the office till 1890; the subjects chosen for his lectures were the results of the Rothamsted investigations. He received honorary degrees from several Universities, and was a member of various foreign academies and societies. On the occasion of the jubilee of the Rothamsted experiments in 1893 he was presented with a piece of plate, and afterwards received the honour of knighthood.

Sir J. H. Gilbert carefully maintained through life a connection with foreign workers. His holidays were frequently occupied by visits to scientific meetings and institutions in Germany and France. He made three visits to the United States and Canada, and delivered several lectures there. He enjoyed a very vigorous constitution, and continued actively at work up to the last year of his life. Unfortunately, his disposition forbade his cooperation with any younger colleague, and the institution at Rothamsted is now left without any apparent successor to its historic labours.

The funeral of Sir J. H. Gilbert took place at Harpenden on December 27; deputations from various scientific bodies attended. The Lawes Agricultural Trust was represented by Sir Chas. B. Lawes, Sir John Evans, F.R.S., Mr. W. Carruthers, F.R.S., Prof. H. E. Armstrong, F.R.S., Dr. J. A. Voelcker and Mr. H. Rix; the Board of Agriculture by Mr. T. H. Elliot; the Royal Society by Mr. A. B. Kempe, F.R.S.; the Chemical Society by Prof. W. A. Tilden, F.R.S., and Prof. W. R. Dunstan, F.R.S.; the Linnean Society by Prof. G. B. Howes, F.R.S.; the Meteorological Society by Mr. F. C. Bayard; the Society of Chemical Industry by Mr. A. Smetham.

NOTES.

PROF. W. A. HERDMAN, F.R.S., sailed for Ceylon on December 26, 1901, to undertake for the Government an investigation of the pearl oyster fisheries of the Gulf of Manaar. He is accompanied by a first-rate assistant, and in Ceylon the inspector of the fisheries and his staff will cooperate and provide boats and divers. A suitable steamer for dredging and trawling will be placed at Prof. Herdman's disposal by the Government of Ceylon; and the necessary gear and apparatus for collecting and observational work, and for biological experiments, have been sent out in advance. We understand that Prof. Herdman has arranged to take samples of the plankton throughout the voyage to Ceylon, and to launch current-floats at particular parts of the course.

A PUBLIC meeting was held on Friday last at Cromarty, the birthplace of Hugh Miller, for the purpose of discussing what steps should be taken to celebrate next year the centenary of his birth. Sir Archibald Geikie wrote stating that he heartily sympathised with the object of the meeting and wished all success to the movement which it would initiate. After discussion, a committee was appointed to further a scheme for the erection in Cromarty of a Miller Institute, comprising a library and museum.

IT is proposed to commemorate, on June 15 next, the two hundredth anniversary of the death of G. E. Rumphius, the celebrated naturalist who spent his life in investigation at Amboina, one of the Molucca Islands. The authorities of the Colonial Museum at Haarlem have made arrangements for the preparation of a Rumphius medal, copies of which can be obtained in silver or bronze. Subscribers for the commemorative medals who send their names to the president or secretary of the Haarlem Museum before March 1 will receive a copy of a memorial volume to be published in honour of Rumphius.

THE death is announced of Mr. H. G. Madan, senior Fellow of Queen's College, Oxford, and for twenty years head of the science department at Eton College.

WE learn from *Science* that Mr. Alexander Agassiz, accompanied by Mr. W. McM. Woodworth, has undertaken an expedition to the Maldive Islands in the Indian Ocean, in order to study the coral formations. A steamboat for this purpose has been chartered at Ceylon.

DR. SVEN HEDIN, the Swedish explorer, who recently arrived at Ladakh from Central Asia, has sent a telegram to King Oscar announcing that he has made an extremely important journey through all Tibet, disguised as a pilgrim, with two followers. On approaching Lhasa they were recognised and captured, but were well treated by order of the Dalai Lama. A second attempt was opposed by 500 Tibetan soldiers. Dr. Hedin's collections were lost, with almost the whole caravan, but his notes were saved.

THE Board of Agriculture has appointed a committee to investigate the two diseases of sheep known as "braxy" and "louping-ill." The members of the committee are Prof. Hamilton, of Aberdeen University, Mr. J. McI. McCall, assistant veterinary officer to the Board, Mr. E. J. Wheler, agent to the Duke of Northumberland, with Mr. R. B. Greig, lecturer on agriculture, &c., to the Durham College of Science at Newcastle-on-Tyne, as secretary and demonstrator. The mortality from the diseases in question is a cause of very great loss to the sheep-farming industry in Scotland, probably amounting to between a quarter and half a million of money annually, or even more.

DR. HANS REUSCH, Director of the Geological Survey of Norway, directs attention, in a recent issue of *Naturen*, to the fact that the rock at Moskogaissa mine, 750 m. above the sea, in Lyngen, Arctic Norway, is covered with a frozen moraine from 18 to 20 metres thick. On a previous occasion Dr.

Reusch found permanent ice in a bog near Vadsö. At lower altitudes, where the soil lets the water through, no permanent ice occurs. Still, at Karasjok the ground is not far from a state of permanent freezing. The mean temperature of the place is −2·6° C. As it is difficult to dig graves in the ground during winter time, a large hole is made in the autumn and bodies are put into it as people die. The bodies soon freeze hard and sometimes they do not thaw in the spring, when they are buried. It has been found that bodies have remained frozen so long as ten years after their burial.

TO the December number of *The Zoologist* Mr. G. Renshaw contributes an interesting article on the extinct blaauwbok (*Hippotragus leucophoeus*) of South Africa. This handsome species, an ally of the sable antelope and the roan antelope, was, it appears, always scarce and local, one of its refuges being the mountains between Swellendam and Algoa Bay, where the last specimens were shot in 1800. Its colour was bluish-grey, with pure white under-parts. The author records sixteen specimens known to have been preserved, but only a few of these appear to be still extant. One skin is now in the museum at Vienna, a second in Stockholm, a third in Upsala, a fourth in Paris and a fifth in Leyden. Our own Natural History Museum possesses a couple of frontlets with horns believed to belong to the blaauwbok. In the same journal Mr. H. E. Howard comments on the marked increase in the numbers of the starling and the hawfinch which has taken place of late years in this country. Writing from Hampshire, he observes of the latter species:—"Fifteen years ago I rarely saw this bird; five years ago small parties of five and six were not at all uncommon; and during the winter now I frequently see as many as a dozen under one yew. This year eight pairs nested within half a mile of my house."

A FEW details concerning the plans of the Scottish Antarctic Expedition are given in the *Dundee Advertiser* of December 25, 1901. The expedition will be directed by Mr. W. S. Bruce, who has had some experience in the Antarctic, and has been engaged in scientific work within the Arctic circle on several occasions. Scientific research will be the chief object of the expedition, and Mr. Bruce will be accompanied by at least seven men of scientific training, who will be engaged with different subjects of investigation. The ship which has been secured for the expedition is a Norwegian whaler called the *Hecla*, a wooden ship of similar dimensions and build to some of the Dundee whalers. The ship will be ready about the beginning of August next and will go for a trial spin for three weeks in the Atlantic for the purpose of testing her gear and instruments before her final departure for the Antarctic, when she will make for the Falkland Islands for the purpose of taking on coal and provisions, and then strike for the field of operations in the Weddell Sea—a region of the Antarctic about which nothing is known, and which has only once been visited by an exploring party, some eighty years ago. This region promises to yield results of very great scientific value, and a thorough knowledge of it would go a long way to solve many of the problems connected with the Antarctic. The Weddell Sea is situated directly between the sphere of operations of the German expedition on the one hand, and the Swedish expedition on the other; so that the results of all three expeditions will be of advantage to each other on their return home. Details of cooperation or division of labour were carefully planned and arranged between the respective leaders of the Scottish, German and Swedish expeditions before the departure of the two latter. It is expected that the expedition will be absent more than a year at least, and possibly much longer if the necessary funds are forthcoming. The whole of the money subscribed towards the expedition has been given by Scotsmen only, and as the scientific staff and ship's officers and crew will also belong to the northern side of the Border, the whole project is a truly Scottish one.

M. C. GUTTON has described in the *Journal de Physique* for December some experiments tending to show that the wave-length of Hertzian oscillations is the same in water as in air. The corresponding property for castor oil has been previously proved by M. Blondlot; the present result is interesting, as in the case of water the imperfect conductivity gives rise to absorption of the oscillations.

A NEW method of determining the principal indices of refraction of a crystal by means of the critical angle has been investigated by M. Cornu, and the results are briefly detailed in the *Bulletin* of the French Physical Society, 172. The method is based on M. Cornu's geometric investigations of the total reflection at the surface of a crystal, and has been applied to calculate the indices of refraction in tartaric acid. In this substance the angle of conical refraction amounts to 4°, and interesting lantern experiments are described on the conical refraction of a crystal 23 mm. thick as well as on ordinary crystals of commercial tartaric acid immersed in clove oil.

THE design and construction of fly-wheels for slow-speed engines for electric lighting and traction purposes are discussed by Mr. A. Marshall Downie in the *Transactions* of the Scotch Institution of Engineers and Shipbuilders, xlv. 1. By projecting the indicator diagrams of the several cylinders of compound engines the author obtains curves representing the fluctuations in the combined crank efforts at different points of the revolution. From an examination of these fluctuations the author arrives at the conclusion that a good average value for the energy necessary to be stored in fly-wheels for electric lighting purposes is 2·9 foot-tons per electric horse-power, and in traction-plant 4 foot-tons.

FROM observations described by Prof Geitel in the *Physikalische Zeitschrift*, iii. 4, it appears that atmospheric air is itself capable of inducing radio-activity. When a mass of air remains shut up for a long time in a cellar or cave, Prof. Geitel finds that its electric conductivity increases to a maximum. There are three hypotheses possible, namely, that the exposed substances were themselves radio-active, that traces of radio-active substances were present in the neighbourhood, or that the air itself is the origin of the radio-activity. From experiments made with a kite at a considerable height above the ground and from other evidence, Prof. Geitel favours the view that the third is the most likely hypothesis.

DR. FOVEAU DE COURMELLES and M. G. Trouvé describe, in the *Bulletin* of the French Physical Society, certain new apparatus for the study of different light-rays of considerable intensity. These are based chiefly on the use of parabolic reflectors and other concentrators, and screens for filtering out the heat-waves or separating those of any required portion of the spectrum. The authors have applied their apparatus to the cure of lupus, tuberculosis, and other diseases at the Hospital of St. Louis in Paris, without producing any burning or blisters, the source of energy being an arc lamp of 10 amperes radiating for 10 minutes at 70 watts, or 8 amperes at 85 watts, while with Finsen's apparatus 75 to 80 amperes for 80 minutes are necessary.

THE arrangements for photochronographic observations in the physiological laboratory of Moscow University form the subject of a paper by Prof. L. Morokhowetz and Drs. A. Samojloff and A. Judin, published by the Imperial University Press. The room used for these observations is divided into four parts, one of which is described as a "monster camera," being a dark room in which the photographs can be exposed and watched during the exposure. Among the apparatus used is a pendulum photochronograph, in which the pendulum carries a sensitive plate and is provided with a contrivance for releasing it at will and fixing it at the end of each half-oscillation. The papers are illustrated by photographs of the curves of different vowel sounds, taken in the laboratory.

The problem of the perfectly irresistible body impinging on a perfectly impenetrable obstacle is scarcely more paradoxical than Poinsot's problem of a rigid body having two points fixed, when it is proposed to calculate the actual reactions and not merely the sum of the reactions along the line joining the points. The *Bulletin* of the Belgian Academy contains reports on a paper by M. Ferron, in which that author endeavours to overcome the indeterminateness of the problem by replacing the force Z at any point in the body by its components in the lines joining its point of application to the two fixed points. One of the referees of the paper, M. Ch. Lagrange, objects to the principle of transmission of force being applied in this case, but he does not hesitate to apply it in a paper of his own, in which he seeks to prove that each of the reactions is equal to ½ Z.

A theory of progressive taxation, capable of being represented by simple mathematical formulæ, is discussed by Mr. G. Cassel in the *Economic Journal* for December. It is pointed out that the same results that are obtained by means of a graduated income-tax can equally well or better be effected by levying a tax at a constant rate per cent. and allowing suitable deductions to be exempted from taxation. Moreover, if a tax is to produce "equal sacrifices" the amount which should be exempted from taxation should be larger for large than for small incomes, as the cost of living consistent with efficiency increases with the amount of income to be earned. Mr. Cassel's proposal is based on the supposition of a "minimum of subsistence" representing the income exempt from taxation, and a "maximum of subsistence" representing the cost of living consistent with efficiency in earning an infinite income. The amount deducted for subsistence and the rate of taxation are then represented by formulæ of the form known to mathematicians as "homographic transformations."

In the use of the wet and dry bulb thermometer for determining the pressure of aqueous vapour in air, considerable uncertainty is introduced by the presence of a constant which varies according to the conditions under which the thermometers are placed. The extremes are represented by August's formula, which supposes the air round the bulbs to be constantly changing, and Maxwell and Stefan's result, which is calculated on the hypothesis that the water on the bulb is evaporating and its vapour diffusing into an infinite mass of quiescent air. Signor G. Guglielmo, writing in the *Atti dei Lincei*, x. 9, now proposes to eliminate the arbitrary constant by the use of a *third* thermometer, the bulb of which is wetted by an aqueous solution the vapour tension of which differs considerably from that of pure water. In this way a further equation is obtained and the unknown constant is eliminated. Some preliminary experiments are quoted showing the efficacy of the method. The difficulties of applying it arise from the change in concentration of the solution caused by evaporation, and the consequent uncertainty as to its latent heat. But could not a second volatile liquid be substituted for the saline solution?

At a recent meeting of the Meteorological Society of Mauritius, the secretary, Mr. T. F. Claxton, read an interesting paper on the objects for which that Society was established, in the year 1851. These were, chiefly:—To provide for regular observations in Mauritius and its Dependencies (Rodrigues, Seychelles, Diego Garcia, &c.), the establishment of a permanent observatory, and the collection and tabulation of observations taken in the Indian Ocean. Some of these objects have been successfully carried out, as shown by the *Transactions* of the Society and the annual reports of the Royal Alfred Observatory. The establishment of this observatory (in 1874) was perhaps the most important achievement of the Society; it is supported entirely from Government funds, and the director has always been the secretary of the Society. Every ship visiting the island is boarded and permission requested to extract observations for the construction of charts. Cyclone tracks of the Indian Ocean were published in 1891 and are of great use to navigators at the present time, and an important work has recently been commenced, viz. the tabulation into 5° squares of all the information collected from the log-books of vessels that have traversed the Indian Ocean since 1854, with the view of constructing a meteorological atlas of the south Indian Ocean; this will doubtless be of much practical use to sailors. Unfortunately, there has been a steady decrease in the number of vessels trading with Mauritius, from 787 in the year 1878 to 283 in 1900, so that the construction of daily synoptic weather charts begun by Dr. Meldrum about 1860 has had to be discontinued, except during cyclone weather.

The Imperial Department of Agriculture for the West Indies has issued a second, and revised, edition of Mr. Maxwell-Lefroy's pamphlet on "The General Treatment of Insect Pests." Another of the pamphlet series, No. 11, "Hints for School Gardens," by the technical assistant, Mr. William G. Freeman, has just been published. It deals, in simple language, with the most elementary principles of agriculture, taking box and pot cultivation as the starting point for school work, and going on to gardening—growing vegetables and flowers and experimenting with manures. Mr. Freeman has written a useful handbook, which should be studied by teachers with Mr. Watts's "Nature Teaching" recently noticed here.

In his annual report on the Antigua Botanic Station, Mr. W. N. Sands, the curator, gives a complete summary of the work for the year ending March 31, 1901. The most interesting feature of the report is a detailed account of an experiment designed to ascertain what a small plot of land about the size of a peasant garden or negro ground would produce in provisions, if properly managed and arranged. The usual method adopted by the peasantry is to grow one or two crops only, and for which they have to wait about five months for a return, which is often poor, and then selling out for a few shillings, often pence. At the Botanic Station a patch 1/10 acre in extent, and overgrown with grass, was taken in hand, and, having been duly cleared, forked and manured, nineteen varieties of vegetables were sown or planted at various periods. In due time such of them as matured were reaped, and sold locally. The sum realised for the produce of the patch was 2*l.* 15*s.*, the expenditure having been 1*l.* 15*s.* 3*d.* Of the latter sum, however, 1*l.* 4*s.* 8*d.* was expended on labour, which would not come out of the peasant's pocket, as he would attend to his garden in his spare time. By the exercise of a little intelligence, therefore, a peasant could make a profit o 2*l.* 4*s.* 5*d.* out of 1/10 acre of land in nine months.

The most important paper in the *Transactions* of the Hull Scientific and Field Naturalists' Club for 1901 is one by Messrs. F. W. Mills and R. H. Philip on the diatoms of the Hull neighbourhood. It is illustrated by no less than sixteen plates, drawn by the first-named author.

The October issue of the *Bulletin* of the Cracow Academy of Sciences contains an important article, by M. Godlewski, on the development of muscular tissue in mammals; and a second, by M. Przesmycki, on certain protozoans parasitic in rotifers. Both are elaborately illustrated.

M. ARMAND GAUTIER contributes to the *Revue Générale des Sciences* of December 15, 1901, an article entitled "Les Mécanismes moléculaires de la Variation des Races et des Espèces," taking as his text the experiments in hybridisation made of late years with the French and American species of vine.

MANY animals have popular names which have been derived from their cries. Prof. T. D. A. Cockerell writes to suggest that this is also the case with the donkey, the "don" representing the inspiratory and "key" the expiratory sound. Most dictionaries describe the word, which is of comparatively recent origin, as signifying a little dun animal, from dun and the diminutive term—key, but the grounds upon which this derivation is based are not easy to find.

TO the *Proceedings* of the Washington Academy of Sciences (vol. iii. pp. 577–600) Dr. C. H. Merriam contributes a paper on the various local forms of the puma. It has long been recognised by naturalists that an animal with such an extensive range must be divisible into a considerable number of geographical races; but Dr. Merriam goes further than this, and considers that several of these ought to rank as species. If such a course were generally adopted it would be advisable to make the puma the type of a genus. Dr. Merriam remarks that these animals are very subject to cleft palate.

WE have received reprints of a series of articles from the November issue of the *Journal* of the Quekett Microscopical Club. In one, Mr. W. Wesche describes a new male rotifer from Hampstead Heath, while Mr. C. F. Rousselet treats of a new species of the same group in a second. In a third, Mr. D. J. Scourfield has notes on the manner in which the freshwater polyp hydra suspends itself from the surface-film of water. In a note on "red rain dust" from Australia, Mr. G. H. Karop shows that, in addition to mineral matter, the substance in question contains a certain number of diatoms, and a percentage of what appear to be sponge-spicules.

WE have received the first number of a new journal, *The Emu*, published at Melbourne, which is to be the organ of the Australasian Ornithologists' Union. In the introductory notice the editor discusses the question whether the name of the bird from which the journal takes its title should be spelt "emu" or "emeu." We are told that the native pronunciation is *emyoo*; and if this be so, according to accepted ideas of transliteration *emeu* makes a nearer approximation to the original than *emu*, which would now be pronounced *emoo* The number before us contains some interesting articles and a couple of excellent photographs of breeding colonies of gannets and frigate-birds. The new venture ought to have a successful future.

A SHORT time ago we noticed a communication by Prof. T. H. Morgan on the regeneration of limbs and other parts of the body in animals. The same investigator contributes to the December issue of the *American Naturalist* an article on regeneration in the egg, embryo and adult. Within the last few years it has been ascertained that portions of an embryo, or even of an unsegmented egg, have the power of producing a new organism; but it has not been determined whether regeneration of parts of an adult organism and of pieces of an egg are similar or identical processes. The author answers the question in the affirmative, but denies that there is any analogy between this process and the natural reparation of a broken crystal. Nevertheless, he connects this recuperative process in animals with a kind of organic "polarity."

THE Christmas number of the *Stock-keeper* is largely devoted to illustrations and descriptions of famous specimens of the more popular breeds of domesticated dogs. The editor, it appears, offered a number of prizes for the best photographs of well-bred dogs by amateurs, and the successful pictures, together with many others, have been reproduced as photogravures in the present issue. Attention is called in an article on the results of the competition to the importance of preserving photographs of the modern breeds of dogs, and regret is expressed that we possess no such records of their predecessors. It may be added that it would be of the highest importance if arrangements could be made for taking photographs of dogs (and other domesticated animals) from above as well as from in front and from the sides.

IN their fifteenth annual report the Liverpool Marine Biological Committee refer with satisfaction to the arrangement concluded with the Government of the Isle of Man whereby they will in future enjoy much larger laboratory accommodation, and, jointly with a committee of the Tynwald Court, be responsible for the conduct of a large aquarium and fish-hatchery. A detailed statement as to how this important change in the position of the committee has been brought about is given, while its probable effects on their work are also mentioned. The greatness of the change may be realised when we state that it involves the moving of the present biological station to a larger and more convenient site on the other side of the bay. The work accomplished during the past year appears to have been large and of a satisfactory nature. The report contains an excellent popular guide to the Port Erin Aquarium, illustrated by figures of a large number of its denizens. Prof. Herdman is to be congratulated on the continued progress of the institutions the interest of which he has so much at heart.

A NOTICE of the collections recently bequeathed by the late Mr. Philip Crowley to the natural history branch of the British Museum appeared a few days ago in *The Times*. A very important portion of the bequest is the collection of eggs, from which 15,200 specimens have been added to the series previously possessed by the Museum. Among the gems in the Crowley cabinet are an egg of the great auk and one of the extinct pied Labrador duck. Both these specimens were acquired by Mr. Crowley from Canon Tristram. The great auk's egg is one of the last "batch" despatched, in 1844, from Iceland to Denmark. The two specimens in the Museum previous to this addition were both cracked and in otherwise poor condition. An interesting item in the collection is the number of clutches of eggs of various species of birds with a cuckoo's egg among them. The Crowley collection has added about 15 per cent. to the species of birds represented by their eggs in the Museum, the increase being especially marked in Australian forms, in which the national collection was previously weak. In addition to eggs, the Museum also acquired a large series of invertebrates, especially butterflies, from the Crowley collection. The article concludes with a reference to the valuable series of specimens from the Uganda district recently presented to the Museum by Sir Harry Johnston. Apart from the okapi and five-horned giraffe, this collection includes a valuable series of fishes from Lakes Victoria and Barengo—the first ever obtained from these waters.

A CATALOGUE of the Mediterranean algæ is commenced by Prof. Francesco Ardissone in the Lombardy *Rendiconti*, xxxiv. 17. The first part deals with Rhodophyceæ, and the author has decided, for stated reasons, to adopt Agardh's classification.

THREE additional volumes of the Yale University Bicentennial Publications have been received. Two contain studies from the chemical laboratory of the Sheffield Technical School, edited by Prof. H. L. Wells, and the third is a text-book on vector analysis, for the use of students of mathematics and physics, founded upon the lectures of Prof. J. Willard Gibbs by Dr. E. B. Wilson. The volumes can be obtained in London from Mr. Edward Arnold.

THE kinematograph is now so frequently employed to reproduce the characteristics of moving objects and scenes that everyone is familiar with its pictures. But twenty years ago, when Mr. Muybridge projected before an audience at the Royal Institution a series of moving pictures illustrating animal locomotion, the results were regarded as veritable photographic triumphs. Since then photography has been utilised in the analysis of motions of many animate and inanimate objects, but Mr. Muybridge's collection of pictures is still the standard work on the various changes which take place in the disposition of the limbs and body of common animals during motion. A cheap edition (price 20*s.*) of the plates illustrating "The Human Figure in Motion" has been published by Messrs. Chapman and Hall, and will doubtless be appreciated by artists and students of anatomy who are unable to study the elaborate work in which the pictures originally appeared.

THE "Annuaire" of the French Bureau des Longitudes is a wonderful repertory of statistical and other information requiring frequent revision if it is to represent existing conditions of knowledge. In the volume for 1902, received a few days ago, we notice that all the dates are expressed in mean civil time, reckoned continuously from 0 hour to 24 hours, and beginning at midnight. The catalogue of minor planets has been brought up to October 2, 1901. M. E. Levasseur brings the statistics of the population of Europe up to the end of October last; and the magnetic elements of the chief places in France are given for the epoch January 1, 1902. As in previous years, there are articles on subjects of wide scientific interest. To the present "Annuaire" M. H. Poincaré contributes an article on telegraphy without intervening wires; M. A. Cornu writes on polyphase currents; M. E. Guyou on the application of the decimal division of the quadrant of a circle to navigation; and M. J. Janssen on the establishment and work of the observatory on the summit of Mont Blanc.

THE as yet unanswered question concerning the source and mode of production of the free electricities, which appear on the separation of two heterogeneous bodies which have been in contact, is the subject of an interesting paper by O. Knoblauch in the last number of the *Zeitschrift für physikalische Chemie*. Seventy-five different substances of various characters were brought into contact with plates of platinum, paraffin, sulphur, and glass, and the positive or negative character of the charge received by the plate on separation was in each case determined. By the assumption of an absorbed film of water on the surfaces of these different bodies, the author finds it possible by application of well-known principles of the ionic theory to account for the character of the charge received by the one substance after it has been in contact with a second.

THE additions to the Zoological Society's Gardens during the past fortnight include a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Captain B. Head; ten Crab-eating Raccoons (*Didelphys cancrivorus*) from South America, a Gangetic Trionyx (*Trionyx gangeticus*) from the Ganges, fifteen Tigrine Frogs (*Rana tigrina*) from India, deposited; a Crimson-breasted Barbet (*Xantholoema haematocephalus*) from India, a Variegated Sheldrake (*Tadorna variegata*) from New Zealand, purchased; a Campbell's Monkey (*Cercopithecus campbelli*) from West Africa, presented by Mr. F. R. Paxman; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Dr. Gray; a Bonnet Monkey (*Macacus sinicus*) from India, presented by Mr. D. Justice.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY.

Jan. 3. Epoch of January meteoric shower (radiant 230° + 53°).
5. 11h. 28m. Minimum of Algol (β Persei).
8. 8h. 17m. Minimum of Algol (β Persei).
9. 10h. Saturn in conjunction with the sun.
9. 15h. Venus at greatest brilliancy.
11. 5h. 5m. Minimum of Algol (β Persei).
12. 4h. 17m. to 5h. 27m. Moon occults *c′* Capricorni (mag. 5·2).
12. 18h. Venus in conjunction with moon. Venus 3° 8′ S.
13. 6h. 23m. to 7h. 1m. Moon occults κ Aquarii (mag. 5·5).
15. Venus. Illuminated portion of disc = 0·218, Mars = 0·990.
15. 11h. Jupiter in conjunction with sun.
21. 8h. 15m. to 8h. 39m. Moon occults 71 Orionis (mag. 5·1).
22. 16h. 56m. to 17h. 28m. Moon occults 68 Geminorum (mag. 5·0).
24. 6h. 7m. to 7h. 1m. Moon occults κ Cancri (mag. 5.0).
24. 17h. 23m. to 18h. 0m. Moon occults ω Leonis (mag. 5·6).
26. 18h. 38m. to 19h. 30m. Moon occults p^5 Leonis (mag. 5·5).
27. 21h. Juno in conjunction with moon. Juno 1° 11′ N.
28. 9h. 59m. Minimum of Algol (β Persei).
31. 6h. 48m. Minimum of Algol (β Persei).

STARS NEAR NOVA PERSEI.—Prof. Ceraski reports in the *Astronomische Nachrichten* (Bd. 157, No. 3755) that on a photograph obtained on the night of 1899 January 30 there is a small star very near the position at present occupied by the Nova. Visual observations with a 15-inch telescope now fail to locate the star, and he asks astronomers with powerful instruments at their disposal to examine this region. The coordinates with respect to the Nova Persei are:—

$$\text{R.A.} = \alpha\ \text{Nova} + 0^{s}.31.$$
$$\text{Decl.} = \delta\ \text{Nova} - 7''.$$

As estimated from the photograph, the star would be of about the 12th magnitude.

MAGNETIC OBSERVATIONS DURING TOTAL SOLAR ECLIPSE.—In the *Journal of Terrestrial Magnetism and Atmospheric Electricity* (vol. vi. pp. 123–143) reports are presented showing the details of observations of the magnetic declination, horizontal and vertical forces during the total solar eclipse of May 17–18, 1901. The stations employed for the determinations given in this issue were at Pola, Austria; Val Joyeux, France; Groningen University, Holland; De Bilt Observatory, near Utrecht; Flushing, Holland. Further reports will be published later, and the whole discussed with the object of investigating the perturbations due to extra-terrestrial causes.

THE TOTAL SOLAR ECLIPSE, MAY 18, 1901.—In *Popular Astronomy* for December, 1901, Prof. E. E. Barnard gives a long description of the preparation, equipment and preliminary experiments undertaken in connection with the last eclipse, and although the weather conditions prevented any positive results being obtained, the record of his methods of dealing with apparatus on such great scale—the plates used were 40 × 40 and 30 × 30 inches—will be of considerable interest and value to workers on future occasions.

NATAL OBSERVATORY REPORT FOR 1900.—The report recently issued by the Government Astronomer of Natal contains as a supplement the details of the observations at the various meteorological stations throughout the colony during the year 1900, with summaries. The returns of several stations are unavoidably incomplete in consequence of the unsettled state of the country.

The instruments, with the exception of the 8-inch Grubb equatorial refractor, are in good order. This instrument will, it is hoped, be shortly dismounted and thoroughly overhauled.

The system of time signals is now established over the colony and is working satisfactorily.